

REMARKS

Claims 1-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over WO '950 in view of Carroll ('744). Claims 1-10 also stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of U.S. Patent No. 6,892,867 in view of Carroll. Applicant respectfully asks the Examiner to reconsider this rejection in view of the below Remarks.

The present invention is directed to a device for transmitting torque between two rotatable, coaxial shaft members. The device includes a number of alternate clutch discs, connected to the two shaft members and engageable to counteract differential rotational speed between the shaft members. The device also includes braking means for braking rotational movement, the rotational velocity in the braking means being proportional to the differential rotational speed between the shaft members. The device also includes means for transmitting the differential rotational speed to the braking means. What particularly separates the present invention from the prior art of which Applicant is aware, however, is the fact that the means for transmitting the differential rotational speed to the braking means comprises a number of balls arranged between on one hand a rotatable, first thrust ring and a second thrust ring attached to one of the shaft members and on the other hand an outer ring fixed to a housing of the device and a gear ring engaging a rotatable brake shaft of the braking means.

Applicant respectfully submits that at least the above-highlighted elements are not disclosed, taught or suggested in any way by WO '950 or Carroll, either alone or in combination.

As discussed in the Background section of the present, WO '950 discloses a torque transmitting device which includes gear means connected to a first shaft member, a pressure plate, which is connected to a second shaft member and is axially displaceable against clutch discs for their engagement, and transmission means between the gear means and the pressure plate for axially displacing the pressure plate against the clutch discs at a certain rotation differential between the gear means and the pressure plate. The braking means is connected to the gear means for providing a braking force to the transmission means for its axial displacement. In this device, the gear means is of the planetary gear type. In a comparatively conventional way, the gear means comprises gear wheels cooperating with the first shaft member, planet wheels, a planet holder device, a fixed gear rim, and a gear ring in engagement with the braking means. However, a disadvantage of planetary gear devices, as employed by the torque transmitting device disclosed in WO '950, is that they are comparatively expensive, which may be a drawback in the road vehicle industry, where costs have to be kept down. Planetary gear devices also tend to emit noise, which is a further drawback in a road vehicle environment. It is an explicitly stated object of the present invention to provide an arrangement without the afore-mentioned drawbacks, but which maintains the reliability in construction and function of planetary gear devices.

Thus, WO '950 does not disclose, teach or suggest in any way that the means for transmitting the differential rotational speed to the braking means comprises a number of balls, particularly a number of balls arranged in the very precise manner claimed. In fact, the Examiner explicitly recognizes that "WO does not teach using balls as the means for transmitting differential rotation."

With respect to Carroll, this reference does disclose the use of balls to transmit rotational motion. However, Carroll does not disclose, teach or suggest in any way using balls to transmit differential rotational speed between two rotatable, coaxial shaft members, as is required by all claims. As such, Carroll does not disclose, teach or suggest in any way balls arranged in the very precise manner claimed (i.e., arranged between on one hand a rotatable, first thrust ring and a second thrust ring attached to one of the shaft members and on the other hand an outer ring fixed to a housing of the device and a gear ring engaging a rotatable brake shaft of the braking means).

Rather, Carroll discloses a vernier mechanism in which two axially aligned shafts (11, 13) are rotated at different rates of speed when a third independently rotatable member, i.e., outer race (20, 21), making contact with each of the shafts (11, 13) through balls (18) and a cooperative disk (14, 15) mounted on each shaft (11, 13), is actuated. The device of Carroll is not used, and cannot be used, to properly transmit differential rotational speed between two rotatable, coaxial shaft members, as is required by all claims. This is so because the structure of the vernier mechanism disclosed in Carroll is different than the present invention, as claimed.

As discussed above, all claims of the present invention require, among other elements, that the balls be arranged between on one hand (1) a rotatable, first thrust ring and (2) a second thrust ring attached to one of the shaft members and on the other hand (3) an outer ring fixed to a housing of the device, and (4) a gear ring engaging a rotatable brake shaft of the braking means. Thus, stated more simply, in order to function properly, the balls must engage (i) a first rotatable thrust ring attached to one of the shaft members, (ii) a second rotatable thrust ring

attached to the other of the shaft members, (iii) an outer ring fixed to the housing, and (iv) a gear ring attached to a third rotatable shaft. Applicant respectfully submits that the balls of Carroll do not engage an outer ring fixed to the housing. Rather, the outer race engaged by the balls of Carroll is defined by outer race members (20, 21), which are fixedly attached to one another by a race shell (23), such that outer race members (20, 21) always rotate together, and with adjustment knob (10), vernier knob (26) and circular plate (25). This arrangement (which is materially and significantly different than what is required by all claims of the present application) causes the device disclosed in Carroll to act as a vernier mechanism, and prevents the device from transmitting differential rotational speed between two rotatable, coaxial shaft members, also as is required by all claims of the present application.

Thus, since neither cited reference discloses (i) a means for transmitting the differential rotational speed to the braking means having a number of balls, and/or (ii) that the balls be arranged in a very specific way between rotatable first and second thrust rings, an outer ring fixed to a housing of the device, and a gear ring engaging a rotatable brake shaft of a braking means, as is required by all rejected claims, Applicant respectfully submits that a combination of the two cited references would not render obvious the rejected claims.

Rather, Applicant respectfully submits that if the two cited references were combined, the resulting device would be a vernier mechanism wherein rotation of the brake shaft (21) of WO '950 would cause the left shaft member (1) and the right shaft member (2) thereof to be rotated at different rates of speed. As such, the device resulting from the combination clearly would not anticipate or render obvious the present invention as claimed.

With respect to the outstanding double-patenting rejection, Applicant respectfully submits that the claims of U.S. Patent No. 6,892,867 ("the '867 patent") do not render obvious the claims of the present invention, either alone or when combined with Carroll. The device claimed in the '867 patent is similar to the device disclosed in WO '950, with the exception that the claims of the '867 patent require a roller arrangement rather than the planetary gearing system of WO '950. Again in this rejection, Carroll is relied upon as teaching a ball arrangement for transmitting differential rotational speed between two rotatable, coaxial shaft members. However, as discussed in detail above, Carroll does not, in fact, disclose, teach or suggest in any way using balls to transmit differential rotational speed between two rotatable, coaxial shaft members, as is required by all claims. Nor does Carroll disclose, teach or suggest in any way balls arranged in the very precise manner claimed (i.e., arranged between on one hand a rotatable, first thrust ring and a second thrust ring attached to one of the shaft members and on the other hand an outer ring fixed to a housing of the device and a gear ring engaging a rotatable brake shaft of the braking means).

As such, since neither the claims of the '867 patent nor the disclosure of Carroll discloses (i) a means for transmitting the differential rotational speed to the braking means having a number of balls, and/or (ii) that the balls be arranged in a very specific way between rotatable first and second thrust rings, an outer ring fixed to a housing of the device, and a gear ring engaging a rotatable brake shaft of a braking means, as is required by all rejected claims, Applicant respectfully submits that a combination of the two would not render obvious the rejected claims. Rather, Applicant respectfully submits that if the claims of the '867 patent and the disclosure of Carroll were combined, the resulting device would be a

vernier mechanism wherein rotation of the braking means of the '867 patent would cause the two rotatable coaxial shaft members thereof to be rotated at different rates of speed. As such, the device resulting from the combination clearly would not anticipate or render obvious the present invention as claimed.

For the foregoing reasons, Applicant respectfully submits that all pending claims, namely Claims 1-10, are patentable over the references of record, and earnestly solicits allowance of the same.

Respectfully submitted,



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Amendments to the Drawings:

No amendments are made to the drawings herein.